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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,237	02/13/2002	Tae-Ho Jang	2522-13	9968

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EXAMINER
GUERRERO, MARIA F

ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 04/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/076,237	Applicant(s) JANG, TAE-HO	
	Examiner Maria Guerrero	Art Unit 2822	

-- The MAILING DATE of this communication appears on the cov r sheet with th correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) *1-6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This Office Action is in response to the Election filed January 29, 2003.

Claims 1-18 are pending.

Election/Restrictions

2. Applicant's election without traverse of Group I, (claims 7-18) in Paper No. 5 is acknowledged.

Claims 1-6 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 5.

Specification

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the Specification does not provide proper antecedent basis for the limitation "the second dose being less than the first dose". Since the claims are part of the original disclosure it is suggested to include this limitation in the Specification.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

4. Claims 9-10 are objected to because of the following informalities: the claims recite: "oxygen ion injecting process is implemented with **$32O_2+$**"; clarification is requested about. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 7, 9, 11-13, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (U.S. 6,232,201) in view of Sadana et al. (U.S. 5,930,643).

Yoshida et al. teaches introducing oxygen ions at a first energy and at a first dose ($1x\ 10^{18}/cm^2$ to $2x10^{18}\ cm^2$) into a surface of a silicon substrate, forming a first oxygen-ion-injected region in the silicon substrate (col. 9, lines 45-55). Yoshida et al. discloses introducing second oxygen ions at a second energy using a sacrificial blocking layer pattern (Fig. 14). In addition, Yoshida et al. shows forming a second oxygen-ion-injected region in an upper portion uncovered by the sacrificial blocking layer pattern; the ion injecting angle being 0° (Fig. 14, col. 14, lines 1-17). Yoshida et al. teaches removing sacrificial blocking layer pattern and forming the insulating layer by

oxidizing through a heat treatment at a temperature of about 1300° to 1400° C (Fig. 15, col. 9, lines 48-55, col. 14, lines 18-22).

Yoshida et al. does not specifically show the second dose being less than the first dose, the heat treatment for about 2-7 hours using an oxidizing atmosphere (argon and oxygen), the introduction of the first and second oxygen ions being sequential. However, Sadana et al. teaches introducing second oxygen ions at a second dose and the second dose being less than the first dose. Sadana et al. discloses the first implant energy from about 30 to about 400 KeV, the second energy from about 50 to about 200 KeV, the oxidation time from 5 to about 12 hours at a temperature of from about 1300° to about 1375° C. in a gas including argon and oxygen. Sadana et al. teaches the introduction of the first and second oxygen ions being sequential (col. 4, lines 10-20, 45-50, col. 5, lines 20-30, col. 7, lines 5-55).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Yoshida et al. reference by including Sadana et al. teachings in order to better control the insulating layer thickness.

6. Claim 8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (U.S. 6,232,201) and Sadana et al. (U.S. 5,930,643) as applied to claims 7, 9, 11-13, and 17-18 above, and further in view of Kim et al. (GB 2309587A).

Regarding claims 8 and 14-16, the combination Yoshida et al. and Sadana et al. does not specifically show the first oxygen ion injected region being a belt-shape or stepped bell shape, oxygen ions passing through the sacrificial layer during the first oxygen introduction, the thickness of the sacrificial layer being approximately 0.05-0.5

microms. However, Kim et al. shows the first oxygen ion injected region being a belt-shape or stepped bell shape. Kim et al. teaches the sacrificial layer being photoresist, polyimide, or SOG, oxygen ions passing through the sacrificial layer during the first oxygen introduction, the thickness of the sacrificial layer being approximately 0.1-0.6 microns (Fig. 3B-3C, pages 3, 7-12).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Yoshida et al and Sadana et al. by including Kim et al. teachings in order to reduce the fabrication time (Sadana et al., page 2, lines 20-25).

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (U.S. 6,232,201) and Sadana et al. (U.S. 5,930,643) as applied to claims 7, 9, 11-13, and 17-18 above, and further in view of F. Namavar et al. "Characterization of low energy SIMOX (les) structures".

Regarding claim 10, the combination Yoshida et al. and Sadana et al. does not specifically show the specific energy as claimed. However, F. Namavar et al. implanting oxygen using a low energy 20-80 KeV as known in the art (page 49).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify the combination of Yoshida et al and Sadana et al. by specifying any appropriated energy because one of ordinary skill in the art would focus on energy at the bottom of F. Namavar's suitable' range 20-80 KeV and to explore energy below that range is obvious.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Roitman et al. (U.S. 6,043,166), Tachimori et al. (U.S. 5,918,151), and Sakaguchi et al. (U.S. 6,350,703) teach forming SOI substrates by oxygen implantation.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

María Guerrero.
Maria Guerrero
Patent examiner
April 7, 2003